



U.S. Nuclear Waste Technical Review Board

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# The U.S. Nuclear Waste Technical Review Board Status Update

Presented to:

**National Transportation Stakeholders Forum**

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# The Board's Statutory Mandate

- The 1987 amendments to the Nuclear Waste Policy Act (NWPA) established the U.S. Nuclear Waste Technical Review Board.
- The Board evaluates the technical and scientific validity of DOE activities related to:
  - transportation, packaging and storage of spent nuclear fuel (SNF) and high-level radioactive waste (HLW)
  - site characterization, design, development, and operations of facilities for disposing of such wastes
- These activities fall under the Board's technical peer-review mandate *regardless of where in DOE those activities are undertaken*.
- The Board reports its findings and recommendations at least twice each year to Congress and the Secretary of Energy.

# About the Board

- The Board is *not* part of the Department of Energy (DOE); it is an independent federal agency.
- The 11 Board members are technical experts who are appointed by the President from a list of nominees submitted by the National Academy of Sciences.
- Board members serve on a part-time basis for 4-year terms, supported by a full-time staff.
- The Board has access to draft DOE documents to ensure that the Board's recommendations can be made during the decision-making process, not after the fact.

# The Board's Technical Review

- The Board's ongoing technical peer review continues even as alternatives to a Yucca Mountain repository are considered.
- The focus of the Board's review has shifted as DOE activities have changed.
- The Board's priority review tasks currently are:
  - Report on technical advancements and issues related to Yucca Mountain
  - Technical basis for extended dry storage and transportation of used nuclear fuel
  - Systems analysis of waste implications of fuel cycle options (NUWASTE)
  - Update of international nuclear waste management programs
  - Survey of facilities managing DOE-owned SNF and HLW

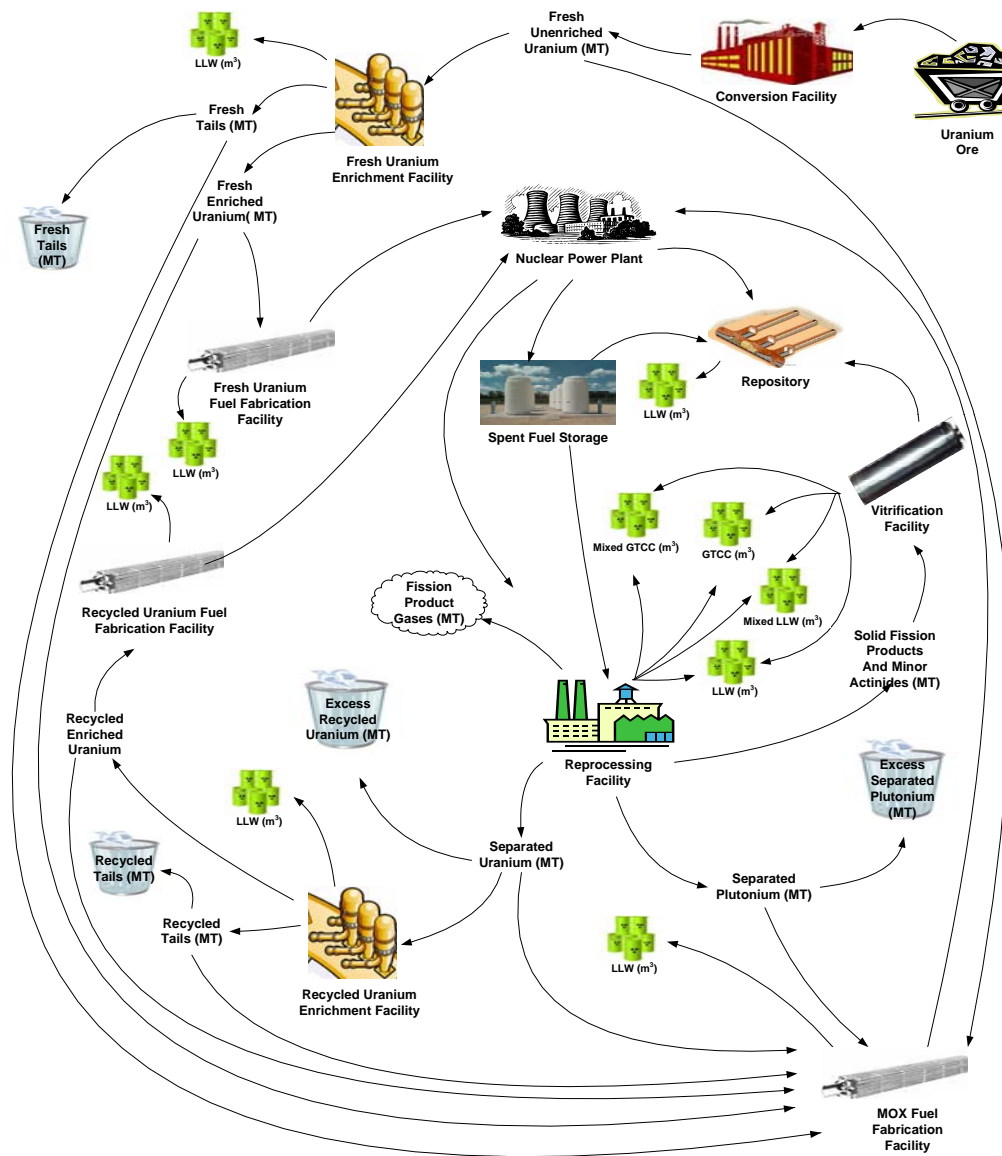
# Transportation Issues Related to Yucca Mountain

- The nuclear fuel cycle includes a waste management system comprised of many interrelated components.
- Transportation is the “glue that holds the system together”.
- It is imperative that the system be analyzed and evaluated as an integrated whole.
- This is essential to harmonizing cask design, fleet acquisition, handling, access/egress and line-haul operations.
- Transportation stakeholders must be vigilant that these interdependencies are recognized and acted upon as part of system design and implementation.

# **Technical Basis for Extended Dry Storage and Transportation of Used Nuclear Fuel**

- Research and monitoring/inspection programs are needed to demonstrate that used fuel can be stored safely for extended periods, and then transported and handled as part of a future waste management program.
- The regulations concerning dry storage of used fuel do not currently address storage for extended periods.
- There also is some inconsistency between the regulations that apply to dry storage and those that apply to transportation.
- It would be helpful in managing extended dry storage of used fuel if the regulations were revised as an integrated set.

# NUWASTE Process Operations & Material Flow

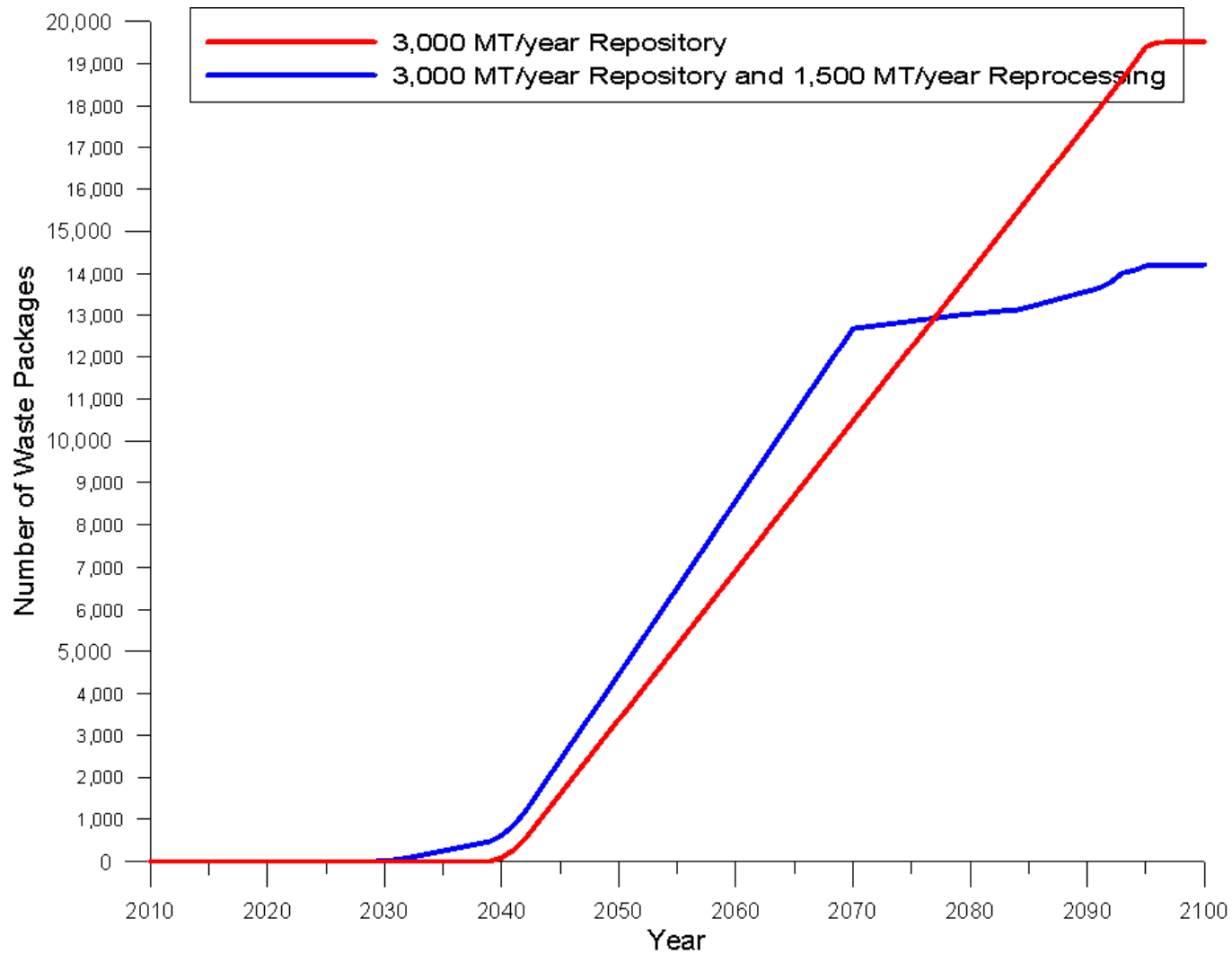


# Preliminary Analysis Findings

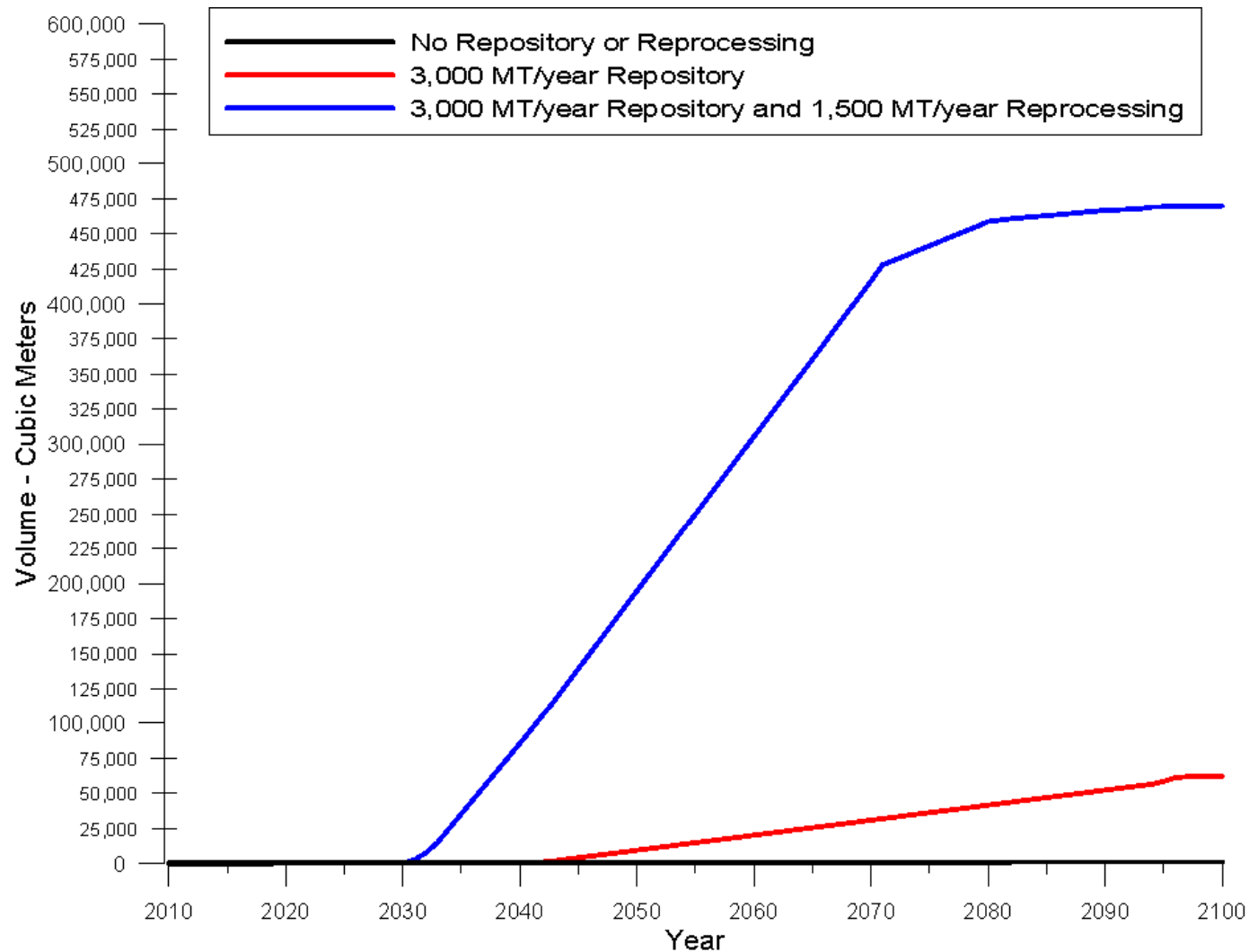
- For all scenarios, a geologic repository will be needed for direct disposal of SNF and disposal of vitrified HLW.
- Even under optimistic conditions, more than 6,000 dry-storage casks will be required.
- Maximum savings in waste packages as a result of reprocessing is approximately 25%.
- Large quantities of other radioactive wastes are produced during reprocessing.
- Maximum savings in natural uranium use from reprocessing is ~ 7% given reprocessed uranium enrichment license limits.
- Unless sufficient MOX fuel is fabricated, reprocessing will generate significant stockpiles of plutonium.



# Number of Waste Packages Required



# Quantity of LLW and GTCC Waste Generated



# Direction of Future NUWASTE Activities

- Evaluate other scenarios to understand the sensitivity of analysis results to program characteristics (e.g., facility capacities, operating schedules)
- Include additional functionality
  - Facility construction, operating & decommissioning cost
- Expand NUWASTE scope
  - Transportation requirements at each stage of the fuel cycle
  - Centralized storage capacity needs
  - Disposition of DOE HLW and SNF
  - Alternative reprocessing & reactor technologies

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